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CASE STUDY

Real-Time Fleet Analytics and Smart Asset Maintenance at DB Cargo

Executive summary

DB Cargo is Europe's largest rail freight operator, and last year its fleet carried 300 million tons of cargo including autos, construction materials and consumer goods across Europe. High-quality service and reliability are the focus at DB Cargo, and the organization strives to drive efficiency across its operations to better serve its customers. Embarking on a journey towards digitization, DB Cargo needed a solution to provide visibility into the health of its locomotives, improve customer experience, and reduce maintenance dwell time. Since deploying Splunk Enterprise, the company has seen benefits including:

- A move to condition-based maintenance
- Real-time view into fleet health and performance
- Increased fleet availability and improved customer experience

Why Splunk

DB Cargo is Europe's largest railway operator managing one of the largest fleets of locomotives. To improve the service quality of this asset-heavy business, with some of these assets up to 25 years old and the infrastructure supporting them also aging, the organization embarked on an effort to digitize the fleet. A key driver for this was a recurring situation where a train driver would receive a failure alert during operation and call the technical helpline for guidance on the best possible action. These alerts were in some cases unclear, in others benign, but as the technical helpline operators had no visibility into the real state of the locomotive, for safety reasons they often had to recommend that the driver take their locomotive into maintenance. This led to service disruption with assets out of service instead of earning money.

The DB Cargo fleet is made up of multiple locomotive types from different manufacturers. A locomotive produces about 60 different time series values from sensors – ranging from temperature to rpm of the engine – and 7,000 different diagnosis or status messages. "We needed a solution that could handle large volumes of diverse data in real time, which made Splunk Enterprise an obvious choice," says Fabian Stöffler, vice president asset digitization, DB Cargo. The company now uses the Splunk platform to provide real-time insights across fleet control, engineering, maintenance and operations.

Industry

- Travel and transportation

Splunk Use Cases

- Internet of Things

Challenges

- Unplanned downtime caused by unnecessary maintenance workshop visits
- Lack of real-time visibility into the health and performance of the fleet
- Customer service impacted by unplanned downtime during operations

Business Impact

- Single real-time view of locomotive fleet health and performance provides transparency the company didn't have before
- Improved locomotive availability and reduced downtime leads to enhanced customer service and lower maintenance costs
- Insights from locomotive data have enabled a move towards condition monitoring

Data Sources

- Onboard telematics devices
- Legacy operations systems
- Component / sensor interface (including GPS)
- Maintenance and in service guidelines for locomotive operation

Splunk Products

- Splunk Enterprise

Reduced locomotive downtime

Previously, when issues arose, technical hotline engineers provided remote support to drivers based on phone calls and a locomotive manual. Today, DB Cargo staff analyze real-time, continuous sensor values and GPS information in the Splunk platform to detect issues when they occur. Splunk alerts tied to a rules engine based on failure code tables let the team decide the best action to take when a failure occurs, for example, when the cooling temperature of a locomotive is too high, or the brake cylinder is not working. In conjunction with the locomotive manufacturers, DB Cargo identifies occasions when locomotives can stay in service longer based on the data provided, which creates transparency.

Now, when drivers call the technical hotline with an issue, real-time data from the locomotive supports the identification of the root cause of the problem and helps determine how best to resolve it. Based on real data the engineers can advise whether or not the locomotive needs to go to the maintenance workshop. With these measures, DB Cargo has been able to keep locomotives in service longer and reduce maintenance costs.

"Splunk Enterprise helps us improve reliability and availability of our assets so that we can keep locomotives in service better. This enables us to deliver a better service to our customers, which ultimately makes us more competitive."

Fabian Stöffler, Vice President Asset Digitization
DB Cargo

Condition monitoring

In addition to the engineers, the maintenance crews also have remote access to locomotive data, enabling them to prepare locomotives before they are due into the workshop. This speeds up the process of getting the locomotive through maintenance and back in action. DB Cargo now has a single real-time view of its locomotive fleet. The company has built an overview dashboard that shows the overall health of the fleet, as well as more granular views such as triggered alerts per locomotive class or energy consumption. If a common failure is occurring across the fleet, the technical fleet managers can quickly alert the maintenance team to address it.

"Splunk Enterprise helps us improve reliability and availability of our assets so that we can keep locomotives in service longer than before," says Stöffler. "This enables us to deliver a better service to our customers, which ultimately makes us more competitive."